REMARKS

In the Final Office Action (mailed on March 15, 2006), the Examiner rejected claims 1-3, 5-17, 20-22, 24, 25, 27-36, 39-41 and 43-51. Applicants respectfully request reconsideration of the pending claims in view of the following remarks.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claims 3 and 28 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse these rejections.

Claim 3

The Examiner asserted that claim 3 is "incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections." *See* Final Office Action, page 2 (citing M.P.E.P. § 2172.01). The Examiner stated that he "is not able to determine how the extrusion feed zone related to any other part of the instant invention." *See* Final Office Action, page 2. However, Applicants respectfully assert that subject matter recited in claim 3 is definite, and would be recognized as so by one of ordinary skill. The plain language of the claim in view of embodiments in the specification clearly satisfies 35 U.S.C. § 112, second paragraph. *See, e.g.*, page 4, para. 9; pages 21-22; para. 56-57; Figure 3.

For example, the present specification explains that the extrusion feed zone (e.g., extruder feed tank) and purge zone (e.g., purge column) may be integrated to have a common purge gas

system, where fresh purge gas may be fed to the extruder feed zone. *See* Specification, page 21, para. 56. As described by the specification, such a single purge gas system may accommodate the purge zone, transport of polymer, and the extrusion feed zone into a single system. *See id.* In view of these reasons, Applicants respectfully request that the Examiner withdraw the rejection of claim 3 under § 112.

Claim 28

With regard to claim 28, the Examiner noted that claim 28 "recites that a portion of liquid from the fractionation zone is transferred to the recycle zone." *See* Final Office Action, page 2. The Examiner found this language recited in claim 28 as contradictory with the base claim 25, which states that liquid from the recycle zone is transferred to the reaction zone "without fractionating," *See id.* The Examiner asked "how can fractioned liquid be sent to the recycle zone when the liquid from that zone is explicitly recited as not being fractionated?" *See id.*

First, Applicants agree with the Examiner that base claim 25 recites that hydrocarbon liquid is transferred from the recycle zone to the reaction zone without fractionating the hydrocarbon liquid. However, claim 25 does not require that all of the hydrocarbon liquid in the recycle zone be transferred to the reaction zone without fractionation, as contended by the Examiner.

Second, base claim 25 states that vapor from the recycle zone is transferred to a fractionation zone. This *vapor* may then be processed in the fractionation zone to form a *liquid hydrocarbon.* Dependent claim 28 is specifically directed to the transfer of this liquid

hydrocarbon *from* the fractionation zone, and *not* to any transfer of hydrocarbon liquid *to* the fractionation zone, as apparently thought by the Examiner. *See* Final Office Action, page 2. It is clear from the plain language of the claims in view of the specification that the liquid hydrocarbon recited in claim 28 may be transferred from the fractionation zone to a catalyst mud preparation zone and to the recycle zone (for recycle to the polymerization reactor). *See, e.g.*, Figure 1 and 2. The recitation of claim 28 is definite and satisfies § 112. In view of these reasons, Applicants respectfully request that the Examiner withdraw the rejection of claim 28 under Section 112.

Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1, 2, 5 and 9-14 under 35 U.S.C. 103(a) as being unpatentable over Hanson (5,597,892) in view of Kniel (3,696,162) and Howard et al. (5,533,437). In addition, the Examiner rejected claims 3 and 44 under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Kniel and Howard et al., as applied to claim 1, and further in view of Perry (3,869,807). The Examiner also rejected claims 6 and 7 under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Kniel and Howard et al., as applied to claim 1, and further in view of Kreischer et al. (6,045,661). In addition, the Examiner rejected claims 15-17, 20-22, 24 and 45 under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Kreischer et al., Howard et al., and Perry. Further, the Examiner rejected claims 25, 27, 29-36, 39, 41, 43, 46, 47 and 49-51 under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Kreischer et al., and Howard et al. Lastly, the Examiner rejected claims 28, 40 and 48 under 35 U.S.C. 103(a) as being unpatentable over Hanson in view of Kreischer et al., and Howard et

al., as applied to claims 27, 39, and 46, and further in view of Kufeld et al. (6,559,247). Of these claims, claims 1, 15 and 25 are independent. Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). To establish a *prima facie* case, the Examiner must show that the combination includes *all* of the claimed elements, and also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination or modification. *See ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984).

Elements of the Independent Claims Missing from the Cited Combinations

Independent claims 1 and 25 recite "transferring the mixed stream to a recovery zone where the purge gas and hydrocarbon fluid are separated to form a *recovered purge gas stream* and a recovered hydrocarbon fluid stream . . . [and] *passing at least a first portion of the recovered purge gas stream from the recovery zone to the purge zone.*" The Examiner relied on the Howard reference to disclose these features, stating that the Howard product purge gas 23 is "sent to a separator (115) which separates the [product purge gas 23] into a purge gas portion and a hydrocarbon stream (27)." *See* Final Office Action, pages 3, 9, and 10. However, the compressed vapor 29 exiting the Howard separator 115 is <u>not</u> a recovered purge gas stream *See* Howard, col. 8,

lines 16-33; Figure 1. Instead, this compressed vapor 29 is is a mixture of purge gas and other components. *See* Howard, column 5, lines 50-59. Further this compressed vapor 29 is not sent to a purge zone, as claimed. Instead, vapor 29 is sent to a scrubber column 117. *See* Howard, column 5, lines 50-59; Figure 1. Moreover, all other references cited by the Examiner do nothing to obviate these deficiencies of Howard. Accordingly, independent claims 1 and 25, and their dependent claims, are believed to be patentable over the cited combinations.

Independent claims 15 and 36 recite "a hydrocarbon/purge gas recovery unit adapted to separate hydrocarbon fluid from purge gas, [wherein] the recovery unit is fluidically connected to a top portion of the purge column and adapted to receive a fluid stream comprising purge gas and hydrocarbon fluid from the purge column." The Examiner relied on the Howard reference to teach this feature. However, it is strikingly clear that while the Howard et al. references discloses a separator 107, it plainly does not teach a "purge column," as recited in the instant claims. Further, no recovery unit is fluidically connected to a top portion of a purge column. *See* Howard, FIG. 1. Accordingly, independent claims 15 and 36, and their dependent claims, are believed to be patentable over the cited combination.

Independent claim 46 recites, "transporting an equilibrium vapor of the recovered hydrocarbon liquid to a fractionation system." In contrast, none of the references cited by the Examiner teach such a transfer of equilibrium vapor. *See, e.g.* Kreischer, Figure 2. For example, the cited references do *not* teach a recycle tank, having a liquid level where the equilibrium vapor is processed. Accordingly, independent claim 46 and its dependent claims are believed to be patentable over the cited combination.

Therefore, in sum, the cited references, taken alone or in combination, fail to teach, suggest, or disclose *all* of the features of the independent claims. Moreover, there is no suggestion or motivation to modify or combine the cited references in the manner asserted by the Examiner or in the manner recited in the claims. Therefore, the independent claims 1, 15, 25, 36, and 46, and their dependent claims, are believed to be patentable over all cited combinations. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of the foregoing claims.

Dependent Claims

In rejecting the various dependent claims, the Examiner's cited combinations do not obviate the deficiencies of the references discussed above with regard to the independent claims. Therefore all of the dependent claims are believed to be patentable for the subject matter they separately recite as well as by virtue of their dependency on their respective allowable base claims. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejections and allowance of the claims.

No Motivation to Combine Hanson and Howard

In all rejections under § 103 in the Final Office Action, the Examiner inappropriately modified Hanson liquid slurry polymerization system to incorporate the Howard absorption system. *See* Final Office Action, pages 3 and 6-10. Applicants emphasize that one of ordinary skill in the art would not be motivated to combine the absorption system of Howard, which is designed for a *gas* phase polymerization reactor system, with the liquid polymerization system of

Hanson. After all, the relative volume to solid ratio (of the recovered hydrocarbon to polymer), as well as the recycle conditions (e.g., reactor pressure) are radically different for effluent from a gas phase reactor versus a liquid phase reactor. Again, the Examiner inappropriately relied on such a modification of Hanson in all cited combinations. Accordingly, Applicants respectfully request that the Examiner withdraw all cited combinations and allow the claims.

The Kniel Reference Is Non-Analogous Art

Additionally, as discussed below, Applicants request withdrawal of the Kniel reference because the reference is non-analogous art. The Examiner must present appropriate references to support his rejection. Specifically, the Examiner must present "analogous" prior art. *See* M.P.E.P. §2141.01(a). In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either: 1) be in the field of the applicant's endeavor or, if not, then; 2) be reasonably pertinent to the particular problem with which the inventor was concerned. *See In re Oetiker*, 977 F.2d 1443, 1446; 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1992). A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which deals, logically would have commended itself to an inventor's attention considering his problem. *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858 26 U.S.P.Q.2d 1767 (Fed. Cir. 1993). Applicants respectfully assert the Kniel reference does not satisfy these threshold burdens.

The Kniel reference satisfies neither step of the two-part test described above and thus does not qualify as analogous art. In regard to the first step, even if Kniel discloses a "fractionator," as asserted by the Examiner, it would be in a completely different field of art (i.e., amine regeneration)

from the Applicants' field of endeavor (i.e., slurry polymerization). It is clear that the field of the inventor's endeavor relates generally to a technique for slurry polymerization and the accompanying recovery of effluent *See e.g.,* Specification, pages 1-5. Turning to the cited reference, the mere inclusion of a "fractionator" from a system for amine regeneration does not render the incorrectly incorporated element "fractionator" within the field of the Applicants' endeavor, i.e., a field that encompasses recovery of effluent in a liquid slurry polymerization process. Therefore, the Kniel reference is not in the field of Applicants' endeavor.

In regard to the second step of the analogous art test, the problems associated with the processing of the slurry polymerization reactor effluent are completely different than that of any fractionation in an amine regeneration process. For example, the problems in the present application of recovering and separating hydrocarbon (e.g., diluent, monomer) and purge gas (e.g., nitrogen) are in no way related to the problems in the Kniel reference of amine regeneration and diene carryover. *See, e.g.*, Kniel, Abstract. In relying on the Kniel reference, the Examiner is apparently incorrectly assuming that all fractionation problems are analogous. *See* M.P.E.P. §2141.01(a) (citing *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992) (holding that a "hook" of a garment was not analogous art to a similar "hook" for a hose clamp, reasoning that not all hooking problems are analogous)).

There is simply no evidence whatsoever that similar problems exist in these strikingly different fields of art, much less any evidence to suggest that those skilled in the art of slurry polymerization would consult the art amine regeneration. Similarly, there is no evidence to suggest that those skilled in the art of amine regeneration would consult the art of slurry polymerization. In

sum, the Kniel reference is not reasonably pertinent because the matter with which it deals would not have logically commended itself to the Applicants' attention in considering their problem, or to the attention of any one skilled in the art to which the invention pertains. Therefore, the Kniel reference has failed the second step of the analogous art test. Accordingly, the Kniel reference is believed to be non-analogous art with respect to the present application.

For these reasons, Applicants respectfully request removal of the Kniel reference from consideration. Accordingly, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. §103(a) in which the Examiner relied on the Kniel reference, and allowance of the claims.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of claims 1-3, 5-17, 20-22, 24, 25, 27-36, 39-41 and 43-51. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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